finally a continuous band of protoplasm lying in the old sheath.

(*e*) Formation of a new sheath on the periphery of this band, thus making an "embryonic fibre."

(*f*) Union of the embryonic fibres of the peripheral end with these similarly formed in the central end—the union taking place in the intervening cicatricial tissue.

(*g*) Formation of myeline in the peripheral end as isolated drops usually seen first near the nuclei. These afterwards unite to form a continuous tube. The formation of the myeline proceeds centrifugally, starting from the wound.

(*h*) The outgrowth of new axes from the old axes of the intact fibres of the central end—the outgrowth following quickly upon the development of the myeline.

(*i*) In the central end, especially when connection with the peripheral portion is not made, several new fibres may form within the sheath of an old one, taking the place of the one degenerated.

On the Structure of the Nerve Cells and on the Relation of their Axis Cylinder or Nerve Process, to the Protoplasmic Processes.

By A. S. Dogiel (Archiv F. Mikroscopische Anatomie, B. 41, Heft. i., Bern, February, 1893.)

The observations recorded in this paper have been mainly made upon the nerve cells occurring in the retina of man and the lower vertibrates. With these cells the author is particularly familiar by reason of his careful researches into the structure of the retina, which he has carried on with the aid of the methylene blue method, which in his hands has been brought to a high degree of perfection.

As is well known at the present time, the majority of investigators dealing with the histology of the central nervous system, do not find the cell prolongations, either protoplasmic or nervous, anastamosing among themselves or with the prolongations of other cells.

Dogiel, in this present article, emphasizes several points which are novel, and contrary to accepted opinion.

He finds among certain nerve cells an abundant anastamosis of the fine branches of the protoplasmic processes.

He finds the nerve process arising at points very remote from the nucleated portion of the cell.

Among those cells whose nerve process soon breaks up into a large number of branches, he also finds anastamosis between their terminal branches.

To the two types of cells which have been described by Golgi and others, he adds a third, viz., cells which have no nerve processes, but in which the protoplasmic processes finally unite to form an axis cylinder.

This last point is certainly more a matter of interpretation than any of the others which have just been mentioned; and for ourselves we are inclined to consider the so-called protoplasmic processes in this third type of cells as simply the terminations of an incoming nerve fibre which surround the cell after the manner described by many other observers.

Finally, our author takes up the question of fibrillation in the nerve cell, and attempts to make it a basis for physiological inferences.

His very striking pictures of the relations of the fibrilla in the nerve cell are certainly impressive, although the older literature contains drawings not at all dissimilar.

There is, however, from the histological standpoint, so much yet to be proved, concerning the meaning of fibrillation, that we can hardly give very great weight to inferences based on our present information.

In discussing the fibrilla, he also discusses the inter-fibrillar substance; and suggests that in the various forms of touch-corpuscle, the portions which are not continuous with the axis cylinder proper may be considered as homologous of the inter-fibrillar substance of the nerve cells, again a suggestion which seems to us rather more picturesque than plausible.

It must be remembered, however, that at the present moment there is no graver question than that of continuity among the nerve elements, and a well supported demonstration of such continuity as a general character of the vertebrate nervous system would be a contribution of very wide-reaching importance.

Such continuity appears to be beyond doubt in special localities; for example, the spinal cord of some electric fishes, in which the large nerve cells in the spinal cord are united by broad protoplasmic bridges.